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# ENVIRONMENTAL Fact Sheet

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29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • [www.des.nh.gov](http://www.des.nh.gov)

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## New Hampshire's Gasoline Vapor Recovery Program *Protecting the Air We Breathe*

### **Smog and the Federal Clean Air Act Amendments of 1990**

The Federal Clean Air Act Amendments of 1990 require the states to implement numerous programs to combat ground-level ozone, also known as summertime "smog." New Hampshire has exceeded the federal health standards for ground-level ozone in the counties of Rockingham, Strafford, Hillsborough and Merrimack. Ground-level ozone is known to irritate the nose, throat and lungs, to reduce lung function, and to trigger acute asthma attacks. Active children and adults, and people with respiratory disease such as asthma, are at the greatest risk of adverse health effects. Long-term exposure may permanently damage the lungs.

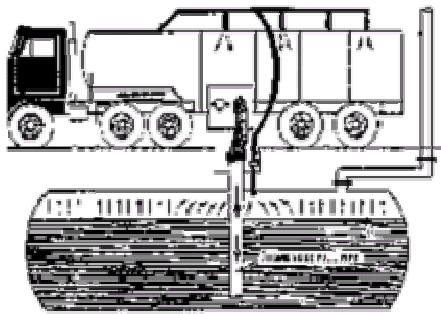
Ground-level ozone, unlike other pollutants, is not emitted directly into the atmosphere by a particular source. It is formed when hydrocarbons, or volatile organic compounds (VOCs), chemically react with nitrogen oxides (NOx). Sunlight and heat stimulate the process and therefore, the highest levels of ozone occur in the summer months. Gasoline vapors contain VOCs that contribute to the formation of ground-level ozone. In addition, gasoline vapors contain many other toxic substances, including benzene, a known carcinogen.

The Clean Air Act Amendments of 1990 make the control of VOC emissions a top priority. Distribution and marketing of gasoline is one of the largest single categories of sources of VOC emissions in New Hampshire. If left uncontrolled, as much as eleven pounds of VOCs may be released for every 1,000 gallons of gasoline during fuel transfers. Considering well over 675 million gallons of gasoline were distributed in New Hampshire in 2007, the control of these emissions is of significant importance. Today, New Hampshire requires stage I and stage II vapor recovery systems to control emissions of VOCs from gasoline dispensing facilities. When properly installed, operated and maintained, these systems can reduce VOC emissions by 95 percent.

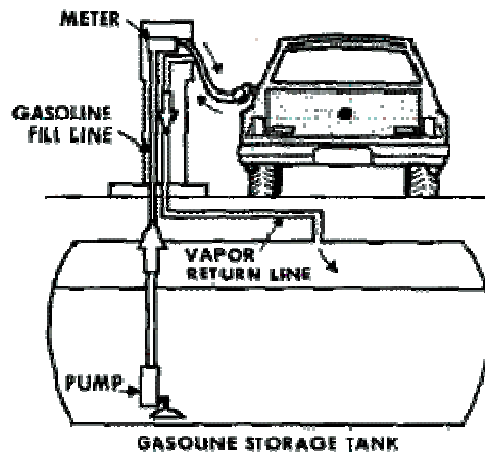
### **What Are Stage I and Stage II Gasoline Vapor Recovery Systems?**

Gasoline vapor recovery systems are categorized under two stages. Stage I gasoline vapor recovery systems capture the vapors expelled from the underground storage tanks at gas stations when being refilled by tank trucks. Stage II systems capture gasoline vapors that would otherwise be vented during individual vehicle refueling at gas stations. Stage I and stage II systems not only reduce air pollution, but they also save money by conserving gasoline that would be lost into the air and protect public health by reducing inhalation of toxic gasoline vapors.

**Typical Stage I Vapor Recovery**



**Typical Stage II Vapor Recovery**



Stage II systems include installation of special fuel dispensing nozzles at the pump. Some nozzles have a rubber boot that forms an airtight seal against the vehicle's gasoline filler opening. Other systems use a more convenient "bellow-less," or "bootless," nozzle. During refueling, vapors are pushed out of the vehicle's gas tank by the incoming fuel. The vapors are then captured by the special nozzle and directed into the underground storage tanks, where they are stored until a bulk delivery is made.

Stage I works in much the same way. Fumes captured and stored by stage II systems during individual vehicle refueling are directed back to the tank truck during refilling of the underground storage tanks. From there, the vapors captured in the tank truck are returned to the bulk-dispensing terminal where they are either recycled or destroyed. The effectiveness of the New Hampshire vapor recovery program, and ultimately the quality of the air, depends on the correct use and functioning of both stage I and stage II gasoline vapor recovery systems.

### **Stage I and Stage II Gasoline Vapor Recovery Systems in New Hampshire**

The Department of Environmental Services Waste Management Division is responsible for implementing stage I and stage II vapor recovery programs under state regulations Env- Wm 1404. Approximately 1,000 gasoline stations statewide are subject to stage I requirements because they have a storage tank capacity of 1,100 gallons or more. Stage I systems require the retrofit of the underground tank with a fill pipe which allows for the return of vapors to the tank truck during refilling. Stage II vapor recovery requirements apply to existing gasoline dispensing facilities in the counties of Rockingham, Strafford, Hillsborough and Merrimack with an annual throughput of 420,000 gallons of gasoline, and any facility constructed since 1990 in the four-county area, regardless of throughput. Over two-thirds of the state's gasoline sales occur in these four counties and, as of 2002, approximately 440 facilities representing roughly 90 percent of the gasoline sold in that area have installed stage II systems.

Depending on the size and site characteristics, the cost of stage II installation can range from \$18,000 to \$30,000, with yearly maintenance costs from \$1,000 to \$4,000. Stage I and stage II controls are very cost effective programs for the reduction of VOC emissions, especially when compared to the alternatives of stricter controls on manufacturing and industrial facilities in the state.

Each facility required to have a stage II system must have that system certified by DES. This certification is valid for up to three years or until a facility undergoes any construction, installation, or significant modification involving the stage II system. To be certified, the facility owner must have the stage II system tested according to specific requirements. A DES employee witnesses most stage II tests to provide greater assurance of compliance.

In addition to the required triennial tests, DES staff inspect all underground as well as aboveground gasoline facilities at least once every three years for compliance with the DES vapor recovery regulations. DES pursues enforcement actions against facilities unwilling to comply with the vapor recovery requirements. Enforcement activities focus primarily on those facilities that have not installed the required stage II controls, have expired certifications, or fail to maintain their equipment.

### **The Future of the Gasoline Vapor Recovery Program**

Since the gasoline vapor recovery program has been in existence, New Hampshire, like most other states, has required that all vapor recovery systems be built, tested, and certified in accordance with the California Air Resources Board (CARB) executive orders, testing procedures, and certifications procedures. DES closely evaluates any CARB changes and has concluded that some of the components of EVR are not currently appropriate for the state of New Hampshire. DES will continue to allow and support the use of existing vapor recovery systems as well as newer EVR systems.

In addition to stage I and stage II vapor recovery requirements, the Clean Air Act Amendments of 1990 also required automakers nationwide to equip new vehicles with “onboard refueling vapor recovery” systems (ORVR). This vapor recovery method returns gasoline vapors displaced during refueling back into the vehicle fuel system. The EPA adopted regulations implementing this requirement in 1994. As of 2000, all new light-duty vehicles sold must be equipped with ORVR systems.

As ORVR equipped vehicles permeate the market, stage II vapor recovery systems may become less necessary, because the vehicles themselves will recapture the harmful gasoline vapors.

For additional information on ground-level ozone, please contact the DES Air Resources Division at (603) 271-1370, or for information on stage I and stage II gasoline vapor recovery systems or ORVR systems, please contact the Waste Management Division at (603) 271-3644.